

REMARKS

Claims 33 and 36-44 are pending in the present application and are rejected. Claims 33, 37, 40, 42 and 44 are herein amended. Claims 36 and 41 are herein cancelled without prejudice. No new matter has been added.

Applicant's Response to Claim Rejections under 35 U.S.C. §112

Claim 37 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 37 recites a biochip reader further comprising a shield having a plurality of apertures aligned with positions of each of the plurality of samples, however the claim omits where the shield is located in relation to the other elements of the reader. It appears that the Office Action regards the location of the shield as essential subject matter which is omitted. The shield is disposed between the light source and the biochip. This is supported by Figure 15 and the corresponding text. In view of this, Applicant herein amends claim 37 to recite this feature. Applicant respectfully submits that this amendment is sufficient to overcome the pending rejection. Favorable reconsideration is respectfully requested.

Applicant's Response to Claim Rejections under 35 U.S.C. §102

Claims 33, 36, 37, 39-42 and 44 are rejected under 35 U.S.C. §102(b) as being anticipated by Tanaami (US Patent Application Publication No. 2001/0001581).

It is the position of the Office Action that Tanaami discloses the embodiments as claimed. Tanaami is directed at a confocal scanner. As illustrated in Figure 1, the scanner includes a laser 1 as a light source, microlens disk 2, a beam splitter 3, a pinhole disk 4, and objective lens 5, a relay lens 7 and a detector 8.

The Office Action alleges that beam splitter 3 is a “separating means” as claimed. It appears that Figure 1 is a conventional confocal scanner. Tanaami discloses that the beam splitter 3 “is a light branching device” in paragraph [0004], but provides few additional comments.

In response, Applicant respectfully indicates that although the beam splitter 3 separates excitation light and fluorescent light from each other based on the wavelength ranges thereof, it does not inherently separate the light as “spectroscopic information.” A dichroic mirror beam splitter 3 which is like that of Tanaami transmits or reflects light selectively according to wavelength. However, a dichroic mirror beam splitter 3 *per se* or as a single piece does not inherently separate light as “spectroscopic information.” Separating light based on “spectroscopic information” is a manner of light separation which takes into account the frequency component of excitation light.

On the other hand, as illustrated in Figure 12, a plurality of dichroic mirrors 31, 32 and 33 with different transmission wavelengths are arranged while varying the angles thereof,

thereby implementing spectroscopic operation like a grating. This is supported at least by page 13, lines 14-22. Note that this paragraph includes a typographical error which is corrected herein. In the absence of such a disclosure, Tanaami cannot disclose the embodiments of independent claims 33 and 40. With respect to inherency, according to MPEP § 2112:

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (emphasis in original).

To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

In other words, the mere fact that Tanaami *may* disclose separating light based on “spectroscopic information” is insufficient. Therefore, for at least the above reasons, Applicant respectfully submits that the rejection of claims 33 and 40 is improper.

As to claims 36 and 41, Applicant herein cancels these claims. Thus, this rejection of these claims is moot.

As to claims 37, 39, 42 and 44, Applicant respectfully submits that these claims are patentable at least due to their direct and indirect dependency on claims 33 and 40, which Applicant submits are patentable for at least the above reasons. Favorable reconsideration is respectfully requested.

Claims 33 and 36-44 are rejected under 35 U.S.C. §102(e) as being anticipated by Dietz et al. (U.S. Patent No. 6,248,988).

It is the position of the Office Action that Dietz discloses the embodiments as claimed. Dietz is directed at optical architectures for microvolume laser-scanning cytometers. As illustrated in Figure 2, the device includes a laser 50, an excitation dichroic filter 58, and objective lens 64, an emission dichroic filter 72 and two CCDs 74 and 76.

It appears to be the position of the Office Action that the excitation dichroic filter 58 is a separating means as claimed. Dietz refers to a Damann grating (see column 6, lines 12-45) and discusses a grating more generally (see column 9, lines 1-25).

In response, as with Tanaami, Applicant respectfully submits that the excitation dichroic filter 58 does not inherently separate light as “spectroscopic information.” In the absence of such a disclosure, Dietz cannot disclose the embodiments of independent claims 33 and 40.

With respect to inherency, according to MPEP § 2112:

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (emphasis in original).

To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

In other words, the mere fact that Dietz *may* disclose separating light based on “spectroscopic information” is insufficient. Furthermore, in Dietz, the object to be measured is not a biochip. Unlike the claimed embodiments, Dietz does not observe images on the entire surface of a biochip at one time. Therefore, for at least the above reasons, Applicant respectfully submits that the rejection of claims 33 and 40 is improper.

As to claims 36 and 41, Applicant herein cancels these claims. Thus, this rejection of these claims is moot.

As to claims 37, 38, and 42-44, Applicant respectfully submits that these claims are patentable at least due to their direct and indirect dependency on claims 33 and 40, which Applicant submits are patentable for at least the above reasons. Favorable reconsideration is respectfully requested.

Claims 33, 36, 39, 40, 41, and 44 are rejected under 35 U.S.C. 102(e) as being anticipated by Li (U.S. Patent Application Publication No. 2003/0223059).

It is the position of the Office Action that Li disclose the embodiments as claimed. Li is directed at a multi-wavelength array reader for biological assay. As illustrated in Figure 5, the reader includes a laser 20 as a light source, an array of sites, a transmission grating beam splitter 38, and a CCD camera 39.

It appears to be the position of the Office Action that the transmission grating beam splitter 38 is a separating means as claimed. Li explains that this grating beam splitter can cause light to diverge and become non-collimated. See paragraph [0063].

As illustrated in Figure 7, a biochip to be read according to the claimed embodiments has, for example, four sites, S1, S2, S3 and S4. S1 and S2 are disposed on the same horizontal line, while S3 and S4 are both disposed on a second horizontal line. The claimed biochip reader separates the light according to spectroscopic information such that all of the spectroscopic information fits between two sites. For example, see Figure 8, which shows spectroscopic information λ_1 - λ_N from site S1 disposed between site S1 and site S2.

On the other hand, in Li, spectroscopic information is arranged vertically below a sample. See Figure 6. According to Li, each row 700 of spectroscopic information is read out sequentially row-by-row. The rows 700 are arranged two-dimensionally on a substrate 704, but the reader does not read out the spectroscopic information from all sites on the substrate 704. The entire array cannot be read out simultaneously. This is because the spectroscopic information of a first row would overlap with other rows, and therefore it would not be possible to discriminate to which row the spectroscopic information belongs. As illustrated in the middle part of Figure 6 of Li, the spectroscopic information of a site 702 of row 700 is displayed as dispersed fluorescence 706. Thus, if the circled row 700 in Figure 6 is regarded as a first row, the spectroscopic information would overlap with, for example, at least one of the second, third and fourth rows. Thus, in Li, it is necessary to repeat image processing every time images from sites for one row are taken in. Therefore, in order to take in images from all the sites in a short time, it is necessary to use a device which is capable of taking images at a high speed and executing arithmetic processing at a high speed.

On the other hand, as shown in Fig. 7 and Fig. 8, in the claimed embodiments, all the spots of samples S1 to S4 formed on the surface of the biochip and images of their spectroscopic information λ_1 to λ_N are formed on an acceptance surface of an optical detector 109 as one image. The optical detector 109 takes in this image at one time. This is supported at least by the passage at page 12, lines 18-24 of the specification. As mentioned above, provided that all the spots of the samples S1 to S4 and images of their spectroscopic information λ_1 to λ_N are formed on the acceptance surface of the optical detector 109 at the same time, it is not necessary to provide a device capable of taking in images at high speed in order to take in images from all the sites. Even if a device capable of taking in images at relatively low speed is used, simultaneous information relative to all the spots can be easily taken in. Further, since the exposure time (integral time) of the optical detector 109 can be set longer, it is possible to obtain a high S/N ratio.

However, in the claimed embodiments, the images of the entire surface of the biochip are scanned at one time, rather than the time consuming row-by-row scanning of Li. In order to further clarify the claimed embodiments, Applicant herein amends the claims to recite that the biochip reader allows the spectroscopic information to be developed “between images of adjacent samples among said plurality of samples.” Applicant respectfully submits that claim 33 is patentable over Li at least because the functional language of the claim imparts structure which Li lacks. Furthermore, claim 40 is patentable over Li for at least the same reason, and additionally because the claimed biochip of the combination further distinguishes over Li.

As to claims 36 and 41, Applicant herein cancels these claims. Thus, this rejection of these claims is moot.

As to claims 39 and 44, Applicant respectfully submits that these claims are patentable at least due to their direct and indirect dependency on claims 33 and 40, which Applicant submits are patentable for at least the above reasons. Favorable reconsideration is respectfully requested.

For at least the foregoing reasons, the claimed invention distinguishes over the cited art and defines patentable subject matter. Favorable reconsideration is earnestly solicited.

If the Examiner deems that any further action by applicant would be desirable to place the application in condition for allowance, the Examiner is encouraged to telephone applicant's undersigned attorney.

If this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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